09/127,483   Patent   #10
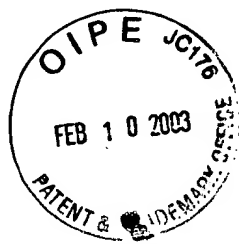
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	
Christopher L. BOYD et al.	
Application No.: 09/127,483	Group Art Unit: 2662
Filed: July 31, 1998	Examiner: Tsegaye, S.
Attorney Docket: 09710-1131	
Client Docket: RIC-97-118	

For: METHOD AND APPARATUS USING ENHANCED ATTACHMENT FOR

IMPROVED CONNECTIVITY IN TELECOMMUNICATIONS

APPEAL BRIEF

Honorable Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

This Appeal Brief is submitted, in triplicate, in support of the Notice of Appeal

filed December 6, 2002.

I.   REAL PARTY IN INTEREST

WorldCom, Inc. is the real party in interest.

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II.   RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any related appeals and interferences.

III.   STATUS OF THE CLAIMS

Claims 1-23 are pending in this appeal. No claim is allowed. This appeal is therefore taken from the July 30, 2002 final rejection of claims 1-23.

IV.   STATUS OF AMENDMENTS

A RESPONSE UNDER 37 CFR 1.116 was timely filed on October 29, 2002. No amendments were requested. An Advisory Action dated 11/20/2002 stated that the request for reconsideration "does NOT place the application in condition for allowance because: Examiner believes that the claims, given their broad reasonable interpretation, read on the reference applied."

V.   SUMMARY OF THE INVENTION

The present invention addresses and solves problems in the digital provisioning of voice services. Much of the recent advancement in telecommunications have been directed specifically to improving data communication, for example, the development of packet switching technology such as Frame Relay (FR) and Asynchronous Transfer Mode (ATM), and Internet Protocol (IP). (Specification, p. 1:9-22)

Attempts to apply the advances in data communications to voice communications, however, have faltered because packet switching network lack the services typically found in a voice network. (Specification, pp. 1:23–2:5) For example, if a voice switch such as a Private Branch Exchange (PBX) is to be adapted to connect to

a Frame Relay (FR) network, a Frame Relay Attachment Device (FRAD) at the originating voice switch needs certain information about the terminating switch to properly set up the call, but it is difficult to provision such an attachment device with the proper information due to the dynamic nature of this information in voice systems. (Specification, p. 2:6-26).

Accordingly, one embodiment of the present invention addresses this problem by having a local attachment device (FIG. 6, FRAD 606) store information about the voice terminals (806) that are accessible through the voice switch (706) that the local attachment device is connected to, and having another, non-local, attachment device (604) request that information (block 233 of FIG. 5A) from the local attachment device (FIG. 6, 606).

VI.   ISSUES

Whether claims 1-20 are patentable over a combination of Von Hammerstein et al (US 6,292,495 B1) in view of White et al (US 6,069,890) under 35 U.S.C § 103(a).

Whether claims 21 - 23 are patentable over a combination of Von Hammerstein et al (US 6,292,495 B1) in view of Koepper et al (US 5,805,690) under 35 U.S.C § 103(a).

VII.   GROUPING OF CLAIMS

The claim groups should not be regarded as all standing together since they recite respective limitations that render each of the groups of claims separately patentable. For the purposes of this appeal, the following groups are recognized as not standing or falling together:

<u>CLAIMS 1, 8, 9,10, 11, 18, 19 and 20</u>

Claim 1 is representative.

<u>CLAIMS 2 and 12</u>

Claim 2 is representative.

<u>CLAIMS 3, 4, 13 and 14</u>

Claim 3 is representative.

<u>CLAIMS 5 and 15</u>

Claim 5 is representative.

<u>CLAIMS 6 and 16</u>

Claim 6 is representative.

<u>CLAIMS 7 and 17</u>

Claim 7 is representative.

<u>CLAIMS 21, 22 and 23</u>

Claim 21 is representative.

VIII.　ARGUMENT

A.　CLAIMS 1-20 ARE PATENTABLE OVER VON HAMMERSTEIN ET AL (US 6,292,495 B1) IN VIEW OF WHITE ET AL (US 6,069,890)

The initial burden of establishing a *prima facie* basis to deny patentability to a claimed invention under any statutory provision always rests upon the Examiner. *In re Mayne*, 41 USPQ2d 1451 (Fed .Cir. 1997); *In re Deuel*, 34 USPQ2d 1210 (Fed. Cir. 1995); *In re Bell*, 26 USPQ2d 1529 (Fed. Cir. 1993); *In re Oetiker*, 24 USPQ2d 1443 (Fed. Cir. 1992). In rejecting a claim under 35 U.S.C. § 103, the Examiner is required to

provide a factual basis to support the obviousness conclusion. *In re Warner*, 154 USPQ 173 (CCPA 1967); *In re Lunsford*, 148 USPQ 721 (CCPA 1966); *In re Freed*, 165 USPQ 570 (CCPA 1970). The Examiner is required to show that all the claim limitations are taught or suggested by the references. *In re Royka*, 180 USPQ 580 (CCPA 1974); *In re Wilson*, 165 USPQ 494 (CCPA 1970).

CLAIMS 1, 8, 9,10, 11, 18, 19 and 20

The Examiner stated (page 3, lines 10 and 11 of the Final Rejection):

"However, Von Hammerstein et al does not disclose storing at the particular attachment device information received in response to the request from the particular attachment device."

The Examiner's quote is the third and last act of claim 1 in its entirety and therefore the Examiner is admitting Von Hammerstein et al does not disclose the third act of claim 1. By way of implication, then, the Examiner is also saying that Von Hammerstein et al does not disclose the second act of claim 1, wherein the particular attachment device generates a request to another attachment device for information respecting voice terminals accessible via the another attachment device's associated voice switch; otherwise, the response to the request would be stored (the third act). Appellant submits that Von Hammerstein et al does not even disclose the first act of claim 1; Von Hammerstein et al (summary, column 5, lines 29 - 40) communicates, and therefore stores, the status information of a plurality of virtual circuits with an object (column 6, lines 34 - 39) to reduce cost by reducing the number of PVCs (Permanent Virtual Circuits, i.e. links) (PVC) without reducing the number of LAN station connections.

Appellants' claimed information respecting voice terminals (T1 and T2 in Figure 1) accessible to the FRAD (303 of Figure 1) through the associated voice switch (PBX 203) is not the same as Von Hammerstein et al's links (PVCs) that are permanent virtual connections through the frame network between FRADs.

While Von Hammerstein et al is directed to managing virtual circuits that pass through a frame relay network (column 1, lines 13-15), Von Hammerstein et al has the stated purpose of enhancing services by communicating link status information (Von Hammerstein et al Abstract), which is not the appellants' recited "information respecting **voice** terminals."

Obviousness rejections require some evidence in the prior art of a teaching, motivation, or suggestion to combine and modify the prior art references. See, e.g., *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001); *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). The Patent Office must give specific reasons why one of ordinary skill in the art would have been motivated to combine the references. See, e.g., *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998). The Examiner stated (page 3, last paragraph of the Final Rejection):

> "It would have been obvious to one ordinary skill in the art at the time the invention was made to add storage for storing at the particular attachment device information received in response to the request from the particular attachment device, such as that suggested by White, in the FRAD of Von Von Hammerstein et al, in order to reduce data processing delay in the frame rely network."

Thus the only reason advanced by the Examiner is "in order to reduce data processing delay in the frame rely network." If anything, such would be an advantage of appellants' claimed invention and denote patentability. The only source on the record for this reason is the appellant's own disclosure. It is fundamental that the motivation to combine references must come from the references themselves, which has not been shown, or If the motivation is to come from general knowledge in the art, that general knowledge must be made of record (*In re Lee*, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002)), and this has not been done.

Appellant's, therefore, respectfully assert that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using appellant's structure as a template and selecting elements from the references to fill in the gaps. *In re Gorman*, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). Recognizing, after the fact, that a modification of the prior art would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner,* 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

Even if combined, White et al does not disclose storing voice terminal information at attachment devices (first act of claim 1 and first means of claim 11), one attachment device requesting the voice terminal information of another attachment device (second act of claim 1 and second means of claim 11), and the one attachment device then storing the received voice terminal information of the another attachment device (third act of claim 1 and third means of claim 11). Therefore, White fails to provide any of

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these elements that are admitted by the Examiner as missing from Von Hammerstein et al.

In addition, a conclusion of obviousness is not compelled by the fact that the prior art could be modified so as to result in the combination defined by the claims; obviousness turns on whether the prior art suggests the desirability of the modification. The requisite motivation to establish a **prima facie** case of obviousness cannot be established by undercutting the expressed objectives of an applied reference. See **In re Fritch**, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992); **In re Gordon**, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); **In re Schulpen**, 390 F.2d 1009, 157 USPQ 52 (CCPA 1968).

In the Examiner's cited passage, col. 4, lines 26-42, (Final Rejection, page 6, line 11) *Von Hammerstein et al* discloses that one technique for reducing the number of PVCs (Permanent Virtual Circuits) required in a frame relay network is to bundle multiple voice PVCs together under a single DLCI (Data Link Connection Identifier). This is accomplished by including <u>multiplexing information</u> in each of the voice packets transmitted to the frame relay network. From the perspective of the frame relay network, the bundled voice PVCs appear to be a single PVC because only one DLCI is allocated. However, when voice packets are received in a remote fragmenter or other frame relay access device that understands the sub-multiplexed addressing format, the remote device can use the multiplexing information to distinguish one PVC from another in a bundle. <u>The voice packets can then be distributed to telephony equipment connected to the remote device according to the multiplexing information.</u> The overall effect is to provide multiple PVCs in a bundle that appears to a frame relay network to be a single PVC.

Appellants disagrees that the multiplexing information used in the *Von Hammerstein et al.* system is *"information respecting voice terminals accessible through the associated voice switch,"* as claimed. Figure 4 of *Von Hammerstein et al* and the accompanying text (col. 4, lines 43-63) disclose that the multiplexing information includes the following fields: $DLCI_{3-0}$ (Data Link Connection Identifier), FECN (Forward Explicit Congestion Notification), BECN (Backward Explicit Congestion Notification), DE (Discard Eligibility), and EA (Extended Address). None of these fields relate to the voice terminals accessible to the associated voice switch. The cited passage merely provides a general disclosure of distributing voice packets to telephony equipment connected to the remote device (i.e., remote fragmenter or other frame relay access device) according to the multiplexing information. This "telephony equipment" cannot be interpreted as the claimed "voice terminals," but refers to a private branch exchange (PBX) which is a separately claimed voice switch in the appellant's invention. For example, as shown in figure 10 of *Von Hammerstein et al*, the CPE-side queue logic 151 outputs to lines of the private branch exchange (PBX). Therefore, the interpretation adopted by the Office Action is technically unsustainable.

Additionally, the Final Rejection (on page 6) reiterates the erroneous contention that the link status messages issued by the remote FRAD of the *Von Hammerstein et al.* system can satisfy the feature of "storing information respecting voice terminals accessible through the associated voice switch," citing col. 7, lines 23-51 of *Von Hammerstein et al.* The link status of *Von Hammerstein et al* relates to the state of the communication paths, specifically the sub-multiplexed PVCs (col. 7, lines 25-33), not appellant's claimed information about the end equipment, the voice terminals. For example, in one implementation of *Von Hammerstein et al*, a first type of link status

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message called a keep alive/connection status (KACS) message is packed with

connection active information and new connection information in a format that does not

exceed a predetermined packet length. Another type of link status message of *Von*

Hammerstein et al, called a congestion management (CM) message is used to supply

rate control information for each of the sub-multiplexed PVCs. In *Von Hammerstein et al*

receiver-not-ready, connection deletion and connection priority information that is

otherwise received in LMI status response messages from the frame relay network is

instead received in one or more additional types of link status messages transmitted

through the frame relay network by the remote FRAD. This Receiver-not-ready

information of *Von Hammerstein et al* is with respect to the local FRAD (see col. 13,

lines 5-14), not the presently claimed voice terminals. Thus, the link status messages of

the *Von Hammerstein et al.* system are not with respect to the voice terminals.

CLAIMS 2 and 12

These claims in addition to being allowable for the reasons put forth for the

allowance of the claims from which they depend, have the following additional

unobvious elements.

To determine which FRADs to send the query of claim 1, the particular

attachment device generates a **query to** accessible **virtual circuits**. This will provide for

completeness of the information obtained in the acts of claim 1 and is therefore used for

a different purpose than any virtual circuit query of Von Hammerstein et al; appellant

relates the PVC information to the terminal information, for example as shown in

appellants Figure 3. Von Hammerstein et al and White do not show such queries,

responses and relations.

CLAIMS 3, 4, 13 and 14

These claims in addition to being allowable for the reasons put forth for the allowance of the claims from which they depend, have the following additional unobvious elements.

These claims provide query and response for exchange of terminal information in the opposite directions of claim 1, which provide the advantages of the invention for both FRADs. Von Hammerstein et al and White do not show the queries and responses in either direction. The Examiner refers to column 13, lines 45 - 65 of Von Hammerstein et al (Final Rejection, page 2, line19), but again Von Hammerstein et al is dealing with link (permanent virtual circuit) information and not the present invention voice terminal (T1, T2, etc) accessibility information.

CLAIMS 5 and 15

These claims in addition to being allowable for the reasons put forth for the allowance of the claims from which they depend, have the following additional unobvious elements.

These claims store, along with the information respecting voice terminals accessible through the attachment device's associated voice switch, information identifying the particular circuit (obtained in claim 2) through which the another attachment device is accessible. This stored association, absent in both Von Hammerstein et al and White, is clearly seen in the right hand portion of Figure 3 wherein the terminal information, e.g. NPA1 gathered in claim 1, is grouped with the associated virtual circuit, in the example it is PVC A obtained in claim 2.

CLAIMS 6 and 16

These claims in addition to being allowable for the reasons put forth for the allowance of the claims from which they depend, have the following additional unobvious elements.

The generating (act 2 of claim 1 timed according to claim 2, is further timed to be executed on initialization of the particular attachment device. This of course is not in White or Von Hammerstein et al, who do no such generating and therefore do not disclose the advantageous timing for the same. Since accessibility of FRADs and terminals change, initialization is an advantageous time to update the information.

CLAIMS 7 and 17

These claims, in addition to being allowable for the reasons put forth for the allowance of the claims from which they depend, have the following additional unobvious elements.

The exchanging of identities of voice terminals accessible is timed to be executed when there is a change in the set of voice terminals accessible through the associated voice switch. This of course is not in White or Von Hammerstein et al, who do no such exchanging and therefore do not disclose the advantageous timing for the same. Since accessibility of terminals change, the time of change is an advantageous time to update the information.

B. CLAIMS 21 - 23 ARE PATENTABLE OVER VON VON HAMMERSTEIN ET AL ET AL (US 6,292,495 B1) IN VIEW OF KOEPPER ET AL (US 5,805,690)

The claim 21 limitation of *"each frame relay attachment device is configured to store an identification of all first voice terminals accessible . . . "* has already been discussed above with respect to Claims 1 and 11, and therefore claim 21 is patentable for the same reasons advanced above.

In the rejection of independent claim 21, the Final Rejection, on page 4, acknowledges that *Von Hammerstein et al.* fails to disclose "each frame relay attachment device is configured to store **an identification of all first voice terminals accessible**, without incurring toll charges, **to the respective private branch exchange of the frame relay attachment device**," as positively claimed in independent claim 21. Consequently, the Final Rejection is forced to rely on *Koepper et al.* for such a supposed disclosure, stating that *Koepper et al.* disclose "listing of all Exchange Codes (ECs) handled by a local routing table of a memory in the DSM [D-Channel Server Module]."

Conspicuously absent from *Koepper et al.* is any discussion or suggestion of a frame relay network. appellants, therefore, respectfully assert that the rejection is based on the improper application of hindsight considerations. It is well settled that it is impermissible simply to engage in hindsight reconstruction of the claimed invention, using appellant's structure as a template and selecting elements from the references to fill in the gaps. ***In re Gorman***, 933 F.2d 982, 18 USPQ2d 1885 (Fed. Cir. 1991). Recognizing, after the fact, that a modification of the prior art would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of

hindsight considerations. Simplicity and hindsight are not proper criteria for resolving

obviousness. *In re Warner*, 397 F.2d 1011, 154 USPQ 173 (CCPA 1967).

In addition, a conclusion of obviousness is not compelled by the fact that the prior

art could be modified so as to result in the combination defined by the claims;

obviousness turns on whether the prior art suggests the desirability of the modification.

The requisite motivation to establish a ***prima facie*** case of obviousness cannot be

established by undercutting the expressed objectives of an applied reference. See *In re*

Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992); *In re Gordon*, 733 F.2d 900,

221 USPQ 1125 (Fed. Cir. 1984); *In re Schulpen*, 390 F.2d 1009, 157 USPQ 52

(CCPA 1968). In this instance, *Koepper et al.*, on col. 7, lines 30-59, discloses various

advantages obtained with the Distributed Transit PBX 30 using a network of DSMs 50,

51, 54, and 56 over that of prior art networks 10, 20, and 20a shown in FIGS. 1, 2 and

3, respectively, are as follows. First, voice compression can be used in voice

communications between two PBXs, and there is no tandeming of voice compression

(which would be the case if it were a collection of PBXs instead of a single distributed

PBX). More particularly, in the prior art network 20a shown in FIG. 3, if a voice call is

made between, for example, PBX 22a and PBX 22d and a voice path needs to be

compressed along the path between PBXs 22a and 22d to save bandwidth, the voice

has to be decompressed and compressed again at each of the Transit PBXs 28a, 28b,

and 28d along the route. With multiple compressions and decompressions, the voice

quality deteriorates. However, if the plurality of Transit PBXs 28a, 28b, 28c, and 28d of

FIG. 3 are replaced by the single Distributed Transit PBX 30 of FIG. 4, then

compression and decompression is performed only once thereby saving the bandwidth

and at the same time not compromising too much of the voice quality since a

compressed path can be established directly between the B channels of the calling and called PBX interfaces. The compression step is performed after a free B channel on the called PBX interface is selected and when the B channel connection is performed. Second, call switching is possible between PBXs 32, 33, 34, 36, 37, 38, and 39 and the Remote Routing Table 87 in each DSM 50, 51, 54, and 56 provides the ability to use alternate routes between DSMS.

The above objectives of the *Koepper et al.* system are not only undercut if the distributed transit PBX is effected across the frame relay network of *Von Hammerstein et al.*, but unachievable if modified in the manner suggested by the Final Rejection. For example, the voice compression objective is achieved by interaction of the B channel and the PBX interfaces, which would not exist with the FRADs. Also, the objective of call switching by using alternate routes between DSMS cannot be readily achieved in the single PVC (using a single DLCI) approach of *Von Hammerstein et al.*

Furthermore, pursuant to MPEP § 2143.02, the Examiner must consider whether the modified system would have a reasonable expectation of success to meet his burden of showing **prima facie** obviousness. The modifications that the Final Rejection is suggesting to the *Von Hammerstein et al.* system to effect the distributed transit PBX of *Koepper et al.* would clearly raise doubts with respect to the expectation of success, given the disparity of the two systems' objectives and technical incompatibilities (e.g., signaling protocols, hardware interfaces, etc.). For example, it is unclear how the Final Rejection intends to successfully modify the multiplexing information (FIG. 4 of *Von Hammerstein et al.*) or the link status information to include the exchange codes (ECs).

IX.   **CONCLUSION AND PRAYER FOR RELIEF**

The references themselves provide no teaching or suggestion for their

combination and to the contrary their disclosures are incompatible for combination as

suggested by the Examiner. Even if combined, the combined references do not disclose

the claimed limitations. There are advantages to the present combination for enhancing

voice communication over a digital packet or frame switched network that is designed for

data as distinguished from voice. Appellants, therefore, request the Honorable Board to

reverse each of the Examiner's rejections.

Respectfully Submitted,

DITTHAVONG & CARLSON, P.C.

2/4/200b

Date

ID-39,929

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APPENDIX

1. A method of enhancing the provision of voice services via packet switched facilities in which a voice switch is connected to the packet switched facilities using an associated attachment device, the method including:

storing, in plural attachment devices, information respecting voice terminals accessible through the associated voice switch,

generating a request from a particular attachment device to another attachment device for information respecting voice terminals accessible via the another attachment device's associated voice switch, and

storing at the particular attachment device information received in response to the request from the particular attachment device.

2. The method of claim 1 wherein the particular attachment device, prior to generating a request to another attachment device, generates a query to one or more virtual circuits, accessible from the particular attachment device, to determine if the channel accesses another attachment device, and generates the request in an instance in which another attachment device is identified.

3. The method of claim 1 or claim 2 wherein the particular attachment device, transmits accessibility information, respecting voice terminals accessible through the voice switch associated with the particular attachment device, to the another attachment device.

4. The method of claim I or claim 2 wherein the another attachment device responds to the request by the particular attachment device by transmitting the accessibility information respecting voice terminals reachable via the associated voice switch.

5. The method of claim 2 in which the particular attachment device stores, along with the information respecting voice terminals accessible through the another attachment device's associated voice switch, information identifying the particular circuit through which the another attachment device is accessible.

6. The method of claim 2 wherein the act of generating a query is executed on initialization of the particular attachment device.

7. The method of claim 4 or 5 which further includes exchanging identities of voice terminals accessible through the associated voice switch with other attachment devices when there is a change in the set of voice terminals accessible through the associated voice switch.

8. The method of claim I or claim 2 in which the attachment device is a frame relay attachment device and the packet switched facility is a frame relay network.

9. The method of claim I or 2 in which the voice switch is a PBX and is also coupled to the PSTN.

10. The method of claim 1 wherein the information respecting voice terminals accessible through the associated voice switch identifies terminals which are directly accessible to the associated voice switch or terminals which are accessible through the associated voice switch through a packet switched network.

11. A system for providing enhanced voice services via packet switched facilities including a voice switch connecting to the packet switched facilities with an associated attachment device, said system including:

means in plural attachment devices for storing information respecting voice terminals accessible through the associated voice switch,

means in a particular attachment device for generating a request to another

attachment device for information respecting voice terminals accessible via the another

attachment device's associated voice switch, and

second storing means in the particular attachment device for storing information

received in response to the request.

12. The system as recited in claim 11 which further includes:

means in plural attachment devices for generating a query to one or more virtual

circuits, accessible from an attachment device, to determine if the circuit accesses

another attachment device, and

wherein said means in a particular attachment device for generating a request,

generates the request in an instance in which another attachment device is identified at

a particular circuit.

13. The system of claim 12 wherein the particular attachment device further

includes transmit means for transmitting accessibility information, respecting voice

terminals accessible through the voice switch associated with the particular attachment

device, to another attachment device after identifying the another attachment device.

14. The system of claim 13 wherein the attachment device includes means to

respond to the request by transmitting the accessibility information respecting voice

terminals accessible via the associated voice switch.

15. The system of claim 13 in which the means for storing stores, along with the

information respecting voice terminals accessible through the attachment device's

associated voice switch, information identifying the particular circuit through which the

another attachment device is accessible.

16. The system of claim 12 or claim 13 wherein the means for generating a query

is operated in response to initialization of the associated attachment device.

17. The system of claim 11 where plural attachment devices further include means, responsive co a change in the set of voice terminals accessible through the associated voice switch, for initiating an exchange of identities of voice terminals accessible through the associated voice switch with other attachment devices.

18. The system of claim 11 in which the attachment device is a frame relay attachment device and the packet switched facility is a frame relay network.

19. The system of claim 11 which the voice switch is a PBX and is also coupled to the PSTN.

20. The system of claim 11 wherein the information respecting voice terminals accessible through the associated voice switch identifies terminals which are directly accessible to the associated voice switch or terminals which are accessible through the associated voice switch through a packet switched network.

21. A system for provisioning voice services over a frame relay network, comprising:

a plurality of voice switch private branch exchanges coupled via respective frame relay attachment devices to a first frame relay network; and

a first plurality of voice terminals coupled to the plurality of private branch exchanges, respectively,

wherein each frame relay attachment device is configured to store an identification of all first voice terminals accessible, without incurring toll charges, to the respective private branch exchange of the frame relay attachment device, and

each frame relay attachment device is configured to store an identification of all first voice terminals accessible, without incurring toll charges, to the other private branch exchanges of the other frame relay attachment devices.

22. The system of claim 21, further comprising:

a plurality of public switched telephone networks coupled to the plurality of private branch exchanges, respectively; and

a second plurality of voice terminals coupled to the plurality of public switched telephone networks, respectively,

wherein each frame relay attachment device is configured to store an identification of all second voice terminals accessible, without incurring toll charges, to the respective private branch exchange of the frame relay attachment device, and

each frame relay attachment device is configured to store an identification of all second voice terminals accessible, without incurring toll charges, to the other private branch exchanges of the other frame relay attachment devices.

23. The system of claim 22, further comprising:

a second frame relay network including respective frame relay attachment devices, private branch exchanges, public switched telephone networks, and first and second voice terminals coupled to the first frame relay network via a common public switched telephone network,

wherein each frame relay attachment device is configured to store an identification of all first second voice terminals accessible, without incurring toll charges, to the respective private branch exchange of the frame relay attachment device of the first and second frame relay networks, and

each frame relay attachment device is configured to store an identification of all first and second voice terminals accessible, without incurring toll charges, to the other private branch exchanges of the other frame relay attachment devices of the first and second frame relay networks.